Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
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WaveSense, Inc. Request for Waiver of the Commission's Part 15 Rules Applicable to Ultra-Wideband Devices	)	ET Docket No. 19-241
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OPPOSITION OF AVIATION SPECTRUM RESOURCES, INC.

Aviation Spectrum Resources, Inc. ("ASRI") hereby submits its opposition to the WaveSense, Inc. ("WaveSense") Request for Waiver ("Request") filed with the Commission on July 25, 2019.[1] In the Request, WaveSense seeks waiver of two interrelated Part 15 Rules governing use of Ultra-Wide Band ("UWB") Ground Penetrating Radar ("GPR"). The two rules in question, 15.509(b) and 15.525, in tandem seek to ensure that GPR devices are "used infrequently with a low proliferation rate" and only after coordination. The Commission ought to ensure protection of authorized users of the radiofrequency spectrum, such as aviation and the Global Positioning System ("GPS"). The Request, which seeks to pave the way for general public use of its devices wherever passenger vehicles (and perhaps others) could travel, would have the Commission, in effect, eviscerate these two rules. In short, WaveSense, although fashioning its filing as a waiver request, seeks a modification of the Commission's rules, which the Commission may not do through a waiver request. The Commission should deny the Request.

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[1] *WaveSense, Inc. Request for Waiver of the Commission's Part 15 Rules Applicable to Ultra-Wideband Devices,* Request for Waiver, ET Docket No. 19-241 (filed July 25, 2019). *See also See Office of Engineering and Technology Seeks Comment on WaveSense, Inc. Request for Waiver of Sections 15.509(b) and 15.525 of the Rules for Use of Ground-Penetrating Radar in Driver-Assistance Safety Technology,* Public Notice, ET Docket No. 19-241, DA 19-834 (rel. Aug. 27, 2019).

ASRI is the communications company of the U.S. commercial aviation industry and is owned by the airlines and other airspace users. As sponsor of the Aeronautical Frequency Committee ("AFC"), ASRI brings together expertise and opinions from across the aviation sector to promote the safe and effective operation of commercial aviation radio communications and navigation systems in use within the U.S.[2] The 117.975 - 137 MHz Aeronautical Mobile (Route) Service ("AM(R)S") allocation in the US is used by both the Federal Aviation Administration, and commercial aviation service providers, to transmit air traffic control and other safety and regularity of flight messages. These VHF services form the foundation of domestic air management and are the primary means of relaying messages for aircraft control nationwide. Therefore, the aviation industry approaches applications that may affect these aviation VHF safety services with significant caution. In addition, aviation relies heavily on both certified and non-certified GPS receivers to ensure the safe and efficient operation of aircraft.

The Request seeks to open the floodgates to proliferation of WaveSense GPR to the general public. Specifically, WaveSense seeks waivers to allow deployment of its GPR devices generally on automobiles and other vehicles that use the roadways for some or all of the time. WaveSense claims that its GPR devices would enable active, accurate lane keeping in otherwise unsafe or unreliable conditions. WaveSense envisions that its GPR devices would be used on vehicles equipped with driver assistance technologies and on autonomous vehicles. There is nothing in the Request to

[2] AFC membership includes: Airlines for America, Alaska Airlines, Air Line Pilots Association, American Airlines, Aircraft Operators and Pilots Association, ASRI, The Boeing Company, Bristow Helicopters, Chevron, Collins Aerospace, Delta Airlines, Era Helicopters, Federal Aviation Administration, Federal Express, Frontier Airlines, Harris Corporation, Helicopter Association International, Helicopter Safety Advisory Conference, International Air Transport Association, JetBlue Airways, National Air Transportation Association, PHI, Inc., Société Internationale de Telecommunications Aéronautique, Southwest Airlines, United Airlines, and United Parcel Service.

suggest that the devices would not be always on while equipped-vehicles are in operation. The Request is accompanied by a very brief and summary Technical Appendix which claims, with minimal supporting analysis and test data, that its GPR devices used as described in the Request would not create a risk of harmful interference to aviation.

Under the Commission's current rules, GPR is restricted to limited fields of use. Section 15.509(b) provides that unlicensed UWB GPR may only be used for "purposes associated with law enforcement, fire fighting, emergency rescue, scientific research, commercial mining, or construction."[3] Further, under Section 15.509(b)(2), within these narrow fields of use, operators must go through coordination under Section 15.525 before deploying and operating the devices.[4] Section 15.525 requires operators seeking coordination to "supply operational areas to the FCC Office of Engineering and Technology, which shall coordinate this information with the Federal Government through the National Telecommunications and Information Administration."[5] The coordination requirement seeks to ensure that operators can be contacted and mitigation measures implemented in the case of interference, despite the coordination.[6]

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[3] 47 C.F.R. §15.509(b).

[4] 47 C.F.R. § 15.509(b)(2).

[5] 47 C.F.R. § 15.525(b).

[6] Thus, Section 15.525(b) requires that the coordination request include "name, address and other pertinent contact information of the user, the desired geographical area(s) of operation, and the FCC ID number and other nomenclature of the UWB device." *Id.* The rules provides that, "[i]f the imaging device is intended to be used for mobile applications, the geographical area(s) of operation may be the state(s) or county(ies) in which the equipment will be operated" must be provided. *Id.* Section 15.525(c) mandates that manufacturers "inform purchasers and users of their systems of the requirement to undertake detailed coordination of operational areas with the FCC prior to the equipment being operated." 47 C.F.R. § 15.525(c). GPR devices may be sold and used by "other qualified users and to different locations upon coordination of change of ownership or location to the FCC and coordination with existing authorized operations." 47 C.F.R. § 15.525(d).

The WaveSense Request would not result in limited waiver of these rules, but would effectively completely eviscerate them. Unlike the *Headsight Waiver*,[7] on which WaveSense relies, the Request would result in the proliferation of GPR devices, and regular use almost everywhere motor vehicles can travel. In the *Headsight Waiver*, the Commission granted a waiver of Section 15.509(b) to permit operation of Headsight's GPR devices "on agricultural equipment operating seasonally in rural areas."[8] The Commission found that the waiver would not undermine the purpose of the rule to ensure that GPR devices are "used infrequently with a low proliferation rate."[9] WaveSense, on the other hand, envisions the use of its devices on motor vehicles generally on (and potentially off) the nation's paved driving surfaces with no conditions to operation. Further, unlike here, Headsight did not seek a waiver of the user coordination requirements of Sections 15.509(b)(2) and 15.525, as does WaveSense.

Notably, another recently filed (and pending) waiver request, that of Geophysical Survey Systems, Inc. ("GSSI"), observes that the use of GPR-based devices in motor vehicles on an unlimited basis (as WaveSense seeks) could well raise the issue of revision of the rules.[10] GSSI seeks a waiver of Section 15.509 to allow a limited number of Localization GPR ("LGPR") evaluation kits to be used only by equipment manufacturers in testing of autonomous vehicles, underscoring that there will be a limited number of units (no more than 2000), "no vehicle equipped

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7 *See Headsight, Inc. Request for Waiver of Part 15 of the Commission' s Rules Applicable to Ultra-Wide Band Devices*, Order, 32 FCC Rcd 1511 (OET 2017).

8 *Id.* at 1514.

9 *Id*. at 1515 ("We find that Headsight's proposed use of the Terrahawk – seasonally, on farm equipment on agricultural land in rural settings and for limited periods of time – is consistent with the criteria of "low proliferation and infrequent use" for GPR, because this specific use of GPR in agricultural applications does not differ greatly from any other permissible use listed in Section 15.509(b), such as that in construction applications.")

10 Geophysical Survey Systems, Inc., Request for Waiver of Part 15 of the Commission's Rules to Market an Ultra-Wideband Evaluation Kit, ET Docket No. 19-155 (filed Ap. 11, 2019)("GSSI Request"). *See also Office of Engineering and Technology Seeks Comment on Geophysical Survey Systems, Inc. Request for Waiver of Certain Part 15 Ultra-Wideband (UWB) Rules*, Public Notice, ET Docket No. 19-155, DA 19-491 (rel. May 30, 2019).

with an operational LGPR will be resold to the general public," and "LGPR units will be sold only for evaluation purposes."[11] GSSI notes that "[t]he marketing of LGPR-equipped vehicles to the general public, were it to occur, would require further waiver *or modification of these provisions* [including Section 15.509]. We emphasize that the present request [of GSSI] seeks authority only to market a limited number of evaluation kits for vehicle manufacturers, and so does not raise these broader issues."[12] GSSI added that, "[d]epending on how lane keeping technologies evolve, radar and vehicle manufacturers may look to other rule sections, or possibly seek the adoption of new rules."[13] In short, as GSSI intimates, proliferation of GPR devices on motor vehicles generally should occur only after notice and comment rulemaking, and not through the backdoor of a waiver request, as WaveSense seeks here.[14]

In addition, WaveSense's effort to have the Commission forego coordination altogether or, in the alterative, to stand in itself for all users of its GPR devices and to seek coordination on a one-time, national basis under a waiver of Section 15.525, which requires users to coordinate with NTIA and the Federal government users flies in the face of the purpose of the coordination rule. WaveSense acknowledges that the coordination requirement was "primarily put in place to keep track of ground penetrating radars that would potentially be used for extended periods in outdoor locations."[15] WaveSense first seeks a waiver of the coordination rule, which is specifically called out in Section 15.509(b), solely on the basis that its GPR devices will meet the emissions requirements of

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11 *GSSI Request* at 7.

12 *Id.* at 6.

13 *Id.*

14 ASRI has made several filings on the *GSSI Request* in ET Docket No. 19-155. Those filings speak for themselves and nothing contained in this Opposition to the WaveSense Request should be construed as a modification of the positions ASRI has taken on the *GSSI Request*.

15 Request at 6 *quoting Kyma Medical Technologies Ltd. Request for Waiver of Part 15 of the Commission's Rules Applicable to Ultra-Wideband Devices*, Order, 31 FCC Rcd 9705 ¶ 19 (2016).

the Part 15 rules.[16] If that were sufficient justification for waiving the coordination requirement, there would be no need for the coordination rule at all.[17] WaveSense's Request in this regard is a thinly masked plea to eliminate the coordination rule and should be rejected.

WaveSense's alternative proposal in support of a waiver of the Section 15.525 waiver requirement is for it to stand in for users. Grant of this proposal would undermine the purpose of the rule it recognizes and elevate form over function. WaveSense asserts that "[i]ndividual operators of driver-assisted and autonomous vehicles that utilize WaveSense's GPR technology cannot reasonably be expected to coordinate with the Commission when they use their vehicles to travel."[18] That may be true – and indeed is a reason why *neither* of the waiver requests WaveSense makes should be granted – but allowing a one-time national coordination with no ability to keep track of GPRs and identify their operators, the acknowledged purpose of the rule, would effectively eliminate the coordination requirement.[19]

While the Commission possesses discretion to grant a waiver "where particular facts would make strict compliance inconsistent with the public interest,"[20] it may do so "only if special circumstances warrant a deviation from the general rule."[21] Where a grant of waiver would

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16 Request at 6-7.

17 Similarly, if compliance with the emissions limits were sufficient, there would be no reason for Section 15.509 of the Rules, limiting the use of GPR devices to certain fields of use. It is not the power limits alone which secure protection, but the emissions limits *combined with* the limited field of use *and* the coordination requirement.

18 *Id.* at 7.

19 Further, WaveSense does not provide with its Request the filing it would make to seek coordination were its alternative request for waiver of Section 15.525 were granted. So, in addition to the fundamental flaws of its Request stated here, it is impossible for the Commission or interested parties to see whether a national one-time waiver through the manufacturer would be an effective exercise to protect aviation and other authorized users from interference from the GPR devices or to redress it, should interference occur. ASRI is concerned that what WaveSense proposes, in effect, would be no coordination at all.

20 *AT&T Corp. v. FCC*, 448 F.3d 426, 433 (D.C. Cir. 2006) (*quoting Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990)).

21 *See Northeast Cellular*, 897 F.2d at 1165–66 (finding an FCC decision to grant a waiver "arbitrary and capricious because it was not based on any rational waiver policy").

contravene the underlying purpose of the rule – here to ensure that GPR devices are "used infrequently with a low proliferation rate" and only after coordination – the waiver should be denied and the issue raised by the waiver request should be dealt with, if at all, through a formal rulemaking process. WaveSense has failed to offer such particular facts or to offer such special circumstances to justify the extreme relief it proposes. And while the objective of improving motor vehicle safety through lane keeping technologies such as those WaveSense has apparently developed is certainly one worth pursuing, it cannot be done through inappropriate procedural channels and without due regard for the protection of authorized users of the radio frequency spectrum or aviation safety.

ASRI also notes that, apart from the foregoing fatal procedural flaws, the Technical Appendix provided with the Request is wholly insufficient to ascertain whether, in fact, as WaveSense claims, the WaveSense GPR devices would present no cognizable threat of harmful interference to aviation, including its reliance on AM(R)S VHF communications. The two-and-one-third-page Technical Appendix provided by WaveSense is far from complete and is lacking significant detail and rigor for an assessment of potential interference to a safety service, especially on a national basis.[22] In brief, the Technical Appendix does not describe the methodology and only considers one specific scenario in Atlanta to a sensor with no results presented to speak of. There is no reason to believe that the singular scenario considered is representative, even assuming for discussion purposes that scenario was appropriately studied. The Technical Appendix does not even consider VHF ground stations, which can be situated near highways or outside the tarmac.[23] In effect, WaveSense simply asks the Commission to trust them on the matter of potential for interference to aviation. Further, apart from road use, there could cases where the GPR device would

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[22] ASRI suggests that the technical Appendix would not be sufficient to allow for successful coordination under Section 15.525 in the specific Atlanta location described by WaveSense.

[23] Instead, the Technical Appendix seems primarily focused only on potential interference to GPS, and even then does not provide a supported demonstration of its results, let alone its conclusions.

be used for vehicles operating on the airport surface, intentionally or unintentionally. Given the issues above and considering the sheer volume of devices that could be utilizing this GPR device, and the variety of potential interference scenarios, the Technical Appendix is wholly inadequate to support a conclusion that the use of GPR devices on motor vehicles generally would not pose an undue threat of harmful interference, whether in response to a procedurally flawed waiver request or in a petition for rulemaking context.

For the foregoing reasons, the WaveSense Request should be denied.

Respectfully submitted,

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